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PCT-Application No.: PCT/EP03/03934

Applicant: HONEYWELL INTERNATIONAL INC. et al.

Our ref: WO 37443

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New claim 1

1. Electric motor cartridge (1) comprising:
- 10 a first cartridge housing portion (2); and
 a second cartridge housing portion (3);
 the cartridge housing portions (2, 3) being coupled
 together so as to assemble the electric motor cartridge (1)
 by radially and axially positioning a stator (4) there
15 between,
 characterized in that
 each cartridge housing portion (2, 3) has a semi-shell
 shape substantially comprised by a bottom portion (5, 6)
 and a cylindrical wall portion (7, 8), wherein
20 each cartridge housing portion (2, 3) provides a bore (12,
 13) in the center of its bottom portion (5, 6) for
 receiving respective portions of a rotor (21).

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New claims 1 to 19

- 10 1. Electric motor cartridge (1) comprising:
a first cartridge housing portion (2); and
a second cartridge housing portion (3);
the cartridge housing portions (2, 3) being coupled
together so as to assemble the electric motor cartridge (1)
15 by radially and axially positioning a stator (4) there
between,
characterized in that
each cartridge housing portion (2, 3) has a semi-shell
shape substantially comprised by a bottom portion (5, 6)
20 and a cylindrical wall portion (7, 8), wherein
each cartridge housing portion (2, 3) provides a bore
(12, 13) in the center of its bottom portion (5, 6) for
supporting respective portions of a rotor (21).
- 25 2. Electric motor cartridge (1) according to claim 1,
wherein at least one of the cartridge housing portions (2,
3) is provided with at least one recess portion (9, 10)
formed at the inner side of the axial end portion of the
cylindrical wall portion (7, 8) which extends at least
30 partially in the circumferential direction of the
cylindrical wall (7, 8) for receiving a projection (11) of
the stator (4).
- 35 3. Electric motor cartridge (1) according to claim 2,
wherein each cartridge housing portion (2, 3) is provided
with one recess portion (9, 10), wherein the recess

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portions (9, 10) are symmetrically to a plane defined by the abutting tips of the cylindrical wall end portions.

4. Electric motor cartridge (1) according to claim 3,
5 wherein at least one of the bottom portions (5, 6) is formed at least partly concave inwardly.

5. Electric motor cartridge (1) according to claim 4,
10 wherein at least one contact area (14, 15) is formed at each of the cartridge housing portions (2, 3) so as to be in contact with respective counter contact areas of two housings (18, 19) between which the cartridge (1) is fittable.

15 6. Electric motor cartridge (1) according to claim 5, wherein in at least one of the cartridge housing portions (2, 3) a circumferentially extending groove (16) is disposed so as to receive an o-ring (17) for sealing
20 between the cartridge housing (2, 3) and one of the two housings (18, 19) between which the cartridge (1) is fittable.

7. Electric motor cartridge (1) according to any one of the preceding claims, wherein cooling slits and any integrated
25 piping for motor cooling is integrated in at least one of the cartridge housing portions (2, 3).

8. Electric motor cartridge (1) according to any one of the preceding claims, wherein the cartridge housing (2, 3) is
30 made of punched metal, any polymer potted material, any die casting material or any sand casting material.

9. Electric motor cartridge (1) according to claim 8, wherein the properties of the material of the cartridge

housing (2, 3) contributes to heat evacuation and heat protection.

10. Electric motor cartridge (1) according to any of the
5 preceding claims, wherein the material properties of the cartridge housing contributes to electromagnetic interference protection.
11. Electric motor cartridge (1) according to any of the
10 preceding claims, wherein at least one of the cartridge housings (2, 3) comprises a connector portion (20) for phases and sensor connections of an compressor motor.
12. Electric motor comprising an electric motor cartridge
15 (1) according to any of claims 1 to 11 and a rotor (21) being encompassed by the stator (4) and supported by the bores (12, 13).
13. Electric motor according to claim 12, wherein the rotor
20 (21) comprises two peripheral portions (22, 23) each having a smaller diameter compared to the diameter of a middle portion of the rotor (21) encompassed by the stator, each peripheral portion (22, 23) comprising a circumferential groove (24, 26) provided with a piston ring (25, 27) for
25 sealing between the inside and the outside of the cartridge (1), wherein the rotor (21) is supported at the two peripheral portions (22, 23) by the bores (12, 13).
14. Electric motor according to claim 12 or 13, further
30 comprising material removal areas on said rotor (21) providing a unitary rotational mass distribution of the rotor.

15. Electric motor according to claim 12, 13 or 14 further comprising a sensor member (28) for detecting the speed of the rotor (21).

5 16. Electric motor according to any of claims 12 to 15, wherein phases and sensors connections are arranged in the connector portion (20) such that they plug directly to wiring end connections when assembling the compressor motor.

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17. Turbocharger comprising an electric motor according to any of claims 12 to 16 and further comprising

a turbine housing (18) for accommodating a turbine wheel (29) driven by exhaust gas;

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a center housing (31) for accommodating a shaft (34) and the electric motor, the shaft serving as a rotor (21) of the electric motor and extending from the turbine wheel (29) through a journal bearing (35) and the electric motor to a compressor wheel (32);

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a compressor housing (19) for accommodating the compressor wheel (32); wherein

the compressor wheel (32) is driven by the turbine wheel (29) via the shaft (34) and can additionally be driven by the electric motor, and

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the electric motor is accommodated in the center housing (31) such that the electric motor is firmly fixed by connecting the center housing (31) to the compressor housing (19).

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18. Turbocharger according to claim 17, wherein one of the cartridge housing portions (2) serves as a seal plate on the journal bearing (35) side and the other cartridge housing portion (3) serves as a backplate on the compressor wheel (32) side.

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19. Compressor comprising an electric motor according to any of claims 12 to 16 and further comprising

5 a motor housing for accommodating a shaft and the electric motor, the shaft serving as a rotor of the electric motor and carrying a compressor wheel; and
a compressor housing for accommodating the compressor wheel; wherein

the electric motor is accommodated in the motor housing such that the compressor motor is firmly fixed by
10 connecting the motor housing to the compressor housing.